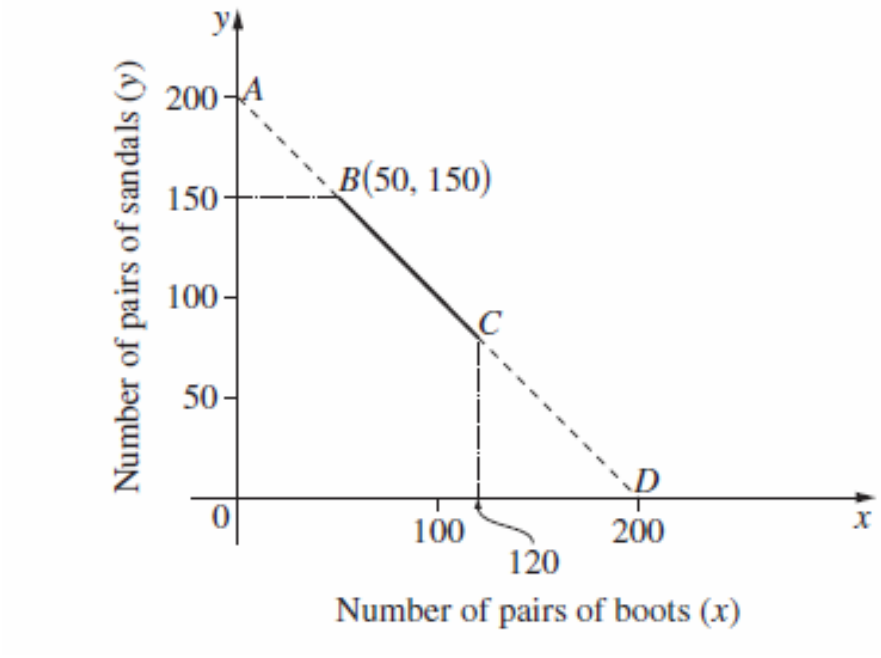
Linear Relationships HSC Past Questions...

2009

(d) A factory makes boots and sandals. In any week

- the total number of pairs of boots and sandals that are made is 200
- the maximum number of pairs of boots made is 120
- the maximum number of pairs of sandals made is 150.

The factory manager has drawn a graph to show the numbers of pairs of boots (x) and sandals (y) that can be made.



(i) Find the equation of the line AD. $m = \frac{-200}{200} = -1$ $b = 200$ $y = -x + 200$ **1**

(ii) Explain why this line is only relevant between B and C for this factory. **1**

Due to constraints of max. no. of boots & sandals

(iii) The profit per week, $\$P$, can be found by using the equation **2**

$$P = 24x + 15y.$$

Compare the profits at B and C.

B: $P = 24 \times 50 + 15 \times 150$
$= \$3450$

C: $y = -120 + 200$
$= 80$

2011

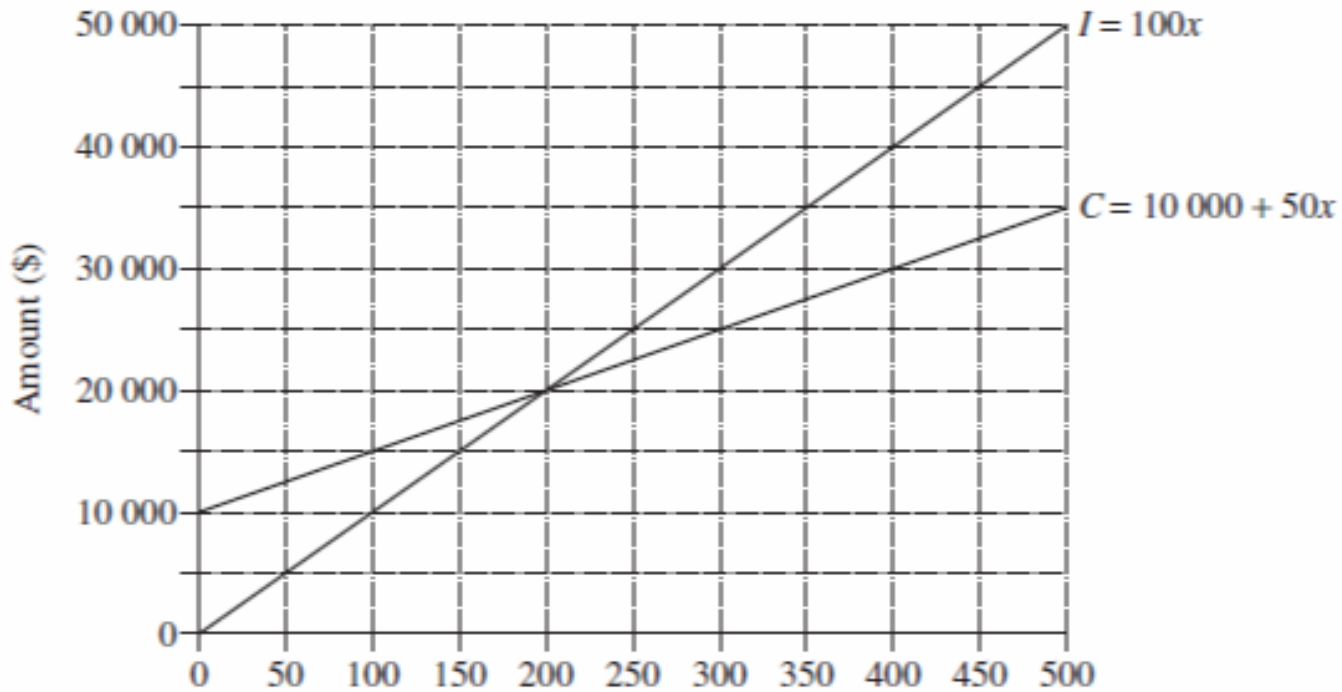
20 A function centre hosts events for up to 500 people. The cost C, in dollars, for the centre to host an event, where x people attend, is given by:

$$C = 10\,000 + 50x$$

The centre charges \$100 per person. Its income I, in dollars, is given by:

$$I = 100x$$

Income and costs for the function centre



How much greater is the income of the function centre when 500 people attend an event, than its income at the breakeven point?

(A) \$15 000

(B) \$20 000

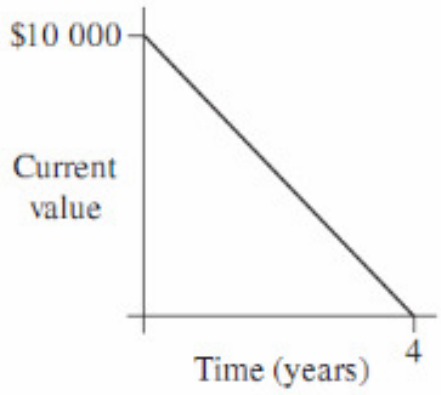
(C) \$30 000

(D) \$40 000

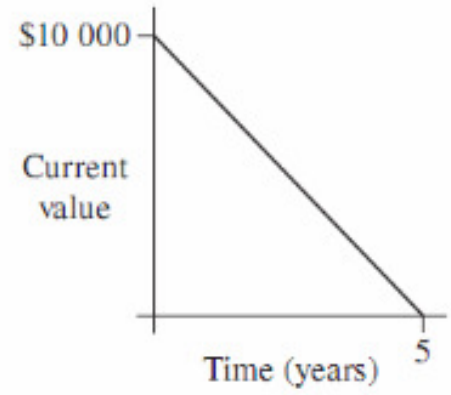
2010

11 Which of the following graphs shows the lowest rate of depreciation over the given time period?

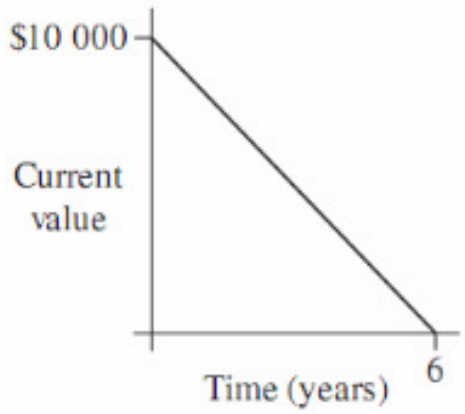
(A)



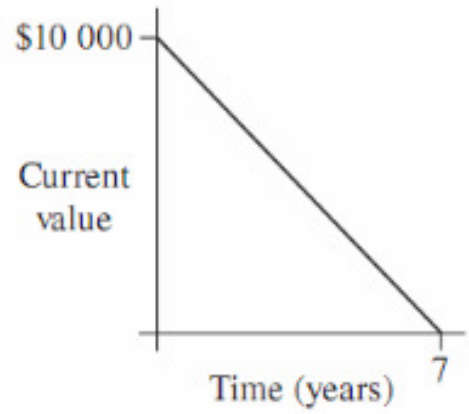
(B)



(C)



(D)



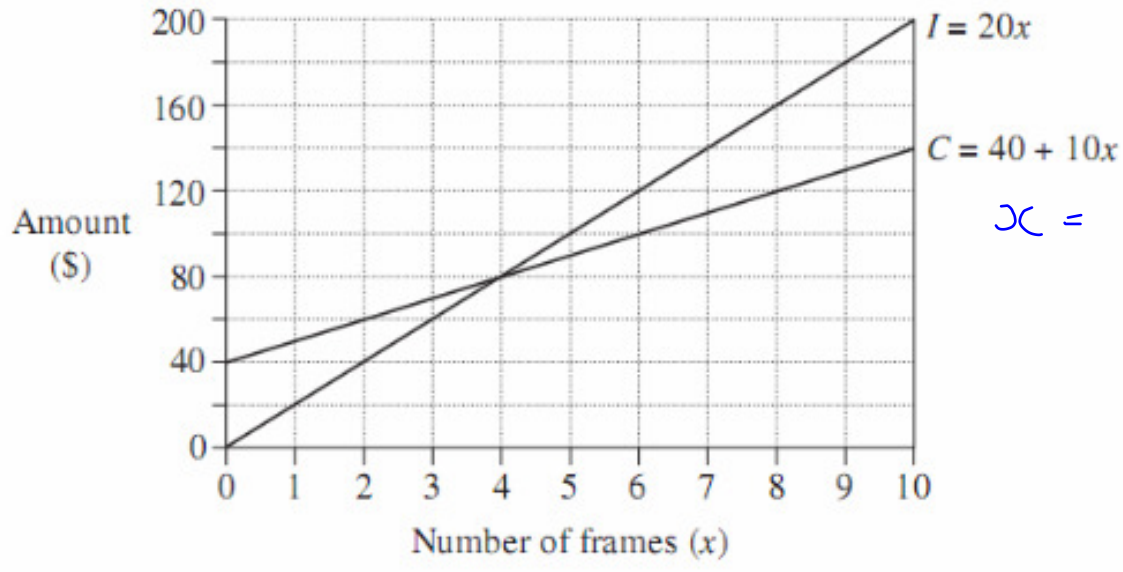
(b) Ashley makes picture frames as part of her business. To calculate the cost, C, in dollars, of making x frames, she uses the equation **2**

$$C = 40 + 10x.$$

She sells the frames for $20 each and determines her income, I, in dollars, using the equation

$$I = 20x.$$

Planned income and costs for Ashley's business



Use the graph to solve the two equations simultaneously for x and explain the significance of this solution for Ashley's business.